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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

MAILED

Application Number: 09/767821
Filing Date: 01/24/2001
Appellant(s): Angel et al.

JUN 14 2007
GROUP 1600

James Remenick
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For Appellant

EXAMINER'S ANSWER
S U P P L E M E N T A L

This is in response to the appeal brief filed on 12/06/2006.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments*

The appellant's statement of the status of amendments contained in the brief is correct.

(5) *Summary of the claimed subject matter*

The summary of claimed subject matter contained in the brief is correct.

(6) *Grounds of Rejection to be Reviewed on Appeal*

The appellant's statement of the issues in the brief is correct.

(7) *Claims Appendix*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied upon

GB 922,457	04/03/1963
US 5,338,814	08/16/1994
Wu et al.	

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 10, and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 922,457 (PTO-1449, 04/09/2001), in view of Wu et al. (5,338,814).

GB '457 discloses a process for preparing graft copolymers of polyvinyl esters comprising polymerizing a vinyl ester such as vinyl acetate, vinyl propionate, vinyl butyrate, vinyl benzoate, or esters of acrylic or methacrylic acid with lower aliphatic alcohols in the presence of polyethers such as polyethylene glycols having a molecular weight between 106 to several millions, preferably between 1000 to 30,000, by adding a

free-radical initiator such as diacetyl peroxide, dibenzoyl peroxide, or azodiisobutyronitrile. See page 2, lines 33-75; page 9, claims 1, **12**. It is further disclosed that the polyalkylene glycol is dissolved in at least one monomer in the presence or absence of additional solvent, and the polymerization is carried out in a homogeneous phase using a free radical initiator. See page 1, lines 55-69. It is also disclosed that the polymerization can be carried out in a continuous manner. See page 2, lines 3-4. On page 3, a graft copolymer obtained by polymerizing 90 parts by weight of vinyl acetate, 10 parts by weight of liquid polyethylene glycol molecular weight 400, and a free radical initiator, dibenzoyl peroxide is disclosed. EXAMPLE 2 discloses a process for preparing a graft polymer comprising heating a solution of vinyl acetate, polyethylene glycol, molecular weight about 2,500, and a free radical initiator, dibenzoyl peroxide, and adding the residual portion comprising the free radical initiator over a course of 2 hours. It is also taught that the grafting of the monomers along the polyethylene glycol chains is induced by means of a radical forming chain transfer mechanism. See page 2, lines 17-21.

GB '457 does not specifically teach the addition of free-radical initiator system in solution consisting of a free radical initiator and a liquid polyethylene glycol having a molecular weight between 88 and 1000.

Wu et al. teach a process for making narrow molecular weight distribution polyvinylpyrrolidone, K-90 polymers having a polydispersity of less than 6, by free radical polymerization. It is also taught that the free radical initiator is added as a solution consisting of a free-radical initiator in liquid polyethylene glycol, or PEG, having

a molecular weight of 300. See column 3, EXAMPLE 2, wherein PEG-300 and 0.2 g of initiator Vazo-67 were added to the mixture comprising monomer, vinylpyrrolidone, and PEG-300.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add free radical initiator as a solution in liquid polyethylene glycol, having a molecular weight between 88 and 1000 because Wu et al. teach the addition of free radical initiator in PEG-300. One of ordinary skill in the art at the time of invention would have been motivated to employ free radical initiator as a solution in liquid polyethylene glycol because 1) Wu et al. teaches the advantage of using liquid polyethylene glycol, PEG-300 i.e better control of the molecular weight distribution, polydispersity, and 2) Wu et al. and GB '457 are both directed to a method of making polymers from monomeric units by free radical polymerization. Thus, one of ordinary skill in the art at the time of invention would have been motivated to add free radical initiator as a solution in liquid polyethylene glycol with the expectation of controlling the properties such as polydispersity of the graft polymers.

(10) Response to Argument

Appellant argues that "A review of the arguments which were made by the Examiner in support of the rejection of appellants claims reveals that the Examiner failed to view the references without the benefit of impermissible hindsight vision afforded by appellants invention."

In response, it must be recognized that any judgement on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it

takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). GB '457 discloses a process for preparing graft copolymers of polyvinyl esters comprising polymerizing a vinyl ester such as vinyl acetate, vinyl propionate, vinyl butyrate, vinyl benzoate, or esters of acrylic or methacrylic acid with lower aliphatic alcohols in the presence of polyethers such as polyethylene glycols having a molecular weight between 106 to several millions, preferably between 1000 to 30,000, by adding a free-radical initiator such as diacetyl peroxide, dibenzoyl peroxide, or azodiisobutyronitrile. It is also disclosed that the polymerization can be carried out in a continuous manner. Wu et al. teach a process for making narrow molecular weight distribution polymers, wherein free radical initiator 0.2 g of Vazo-67 in liquid PEG-300 were added to the mixture comprising monomer, vinylpyrrolidone, and PEG-300. Thus, from the teachings of Wu et al., it would have been obvious to a person of ordinary skill in the art at the time of invention to add free radical initiator as a solution in liquid polyethylene glycol because 1) GB '457 teaches that the graft polymerization can be carried out in a continuous manner 2) Wu et al. teach that the free radical initiator is added in liquid PEO having a molecular weight 300, and has the advantage of better control of viscosity and polymer molecular weight. Thus, one of ordinary skill in the art would have been motivated to add free radical initiator in liquid PEO with the expectation of controlling the viscosity buildup during

polymerization and further having a better control of MW of the polymer. Thus, there is motivation to combine the two references.

Appellants argues that "The disclosure of Wu et al. pertains to the manufacture of poly-vinyl pyrrolidone (PVP) homopolymer in aqueous solution and the chain transfer agent of choice is, in this context, polyethylene glycol (PEG) having a molecular weight of about 300." See page 6 of the brief.

In response, it is pointed out that Wu et al. disclosure pertains to vinyl pyrrolidone polymers which result in a mixture of homopolymers and graft polymers. For example, See column 3, EXAMPLE 2, wherein PEG-300 and 0.2 g of initiator Vazo-67 were added to the mixture comprising monomer, vinylpyrrolidone, and PEG-300. This process of polymerization will result in a mixture of homopolymers, and graft polymers because vinyl pyrrolidone monomer would also graft onto the PEO chain, since the radical formed on PEO chain will also initiate polymerization of vinylpyrrolidone. Moreover, it is pointed out that Wu et al. reference was used to show that free radical initiator can be added as a solution in liquid polyethylene glycol in free radical polymerizations.

Appellants argues that "The disclosure of Wu et al. pertains to the manufacture of poly-vinyl pyrrolidone (PVP) homopolymer in aqueous solution and the chain transfer agent of choice is, in this context, polyethylene glycol (PEG) having a molecular weight of about 300." See page 6 of the brief.

As discussed above the process of Wu et al. See column 3, EXAMPLE 2, comprises polymerizing a monomer such as vinyl pyrrolidone in the presence of liquid PEO-300, and thus results in homopolymers and graft polymers of polyvinylpyrrolidone.

Appellants argues that "any compound which is capable of providing such a "more labile hydrogen atom" to a growing polymer chain functions as a chain transfer agent. Notwithstanding the fact that Wu et al. employ PEG-300 as chain transfer agent in the manufacture of polyvinyl pyrrolidone (PVP) homopolymer, this also shows that any polyalkylene glycol provides the necessary "more labile hydrogen atom" and functions as a chain transfer agent." See page 6 of the brief.

In response, it is pointed out that this argument is not commensurate in scope, as it is not relevant if other compounds can also provide labile hydrogen atom.

Appellant argues that "Notably, the graft copolymerization described in GB 922,457 mandates the presence of polyalkylene glycol in the polymerization mixture since the respective compound provides the chain onto which the monomers are to be grafted. As such, the conditions prevalent in the graft copolymerization of the British reference are clearly not comparable with, or equivalent to, the conditions of Wu et al.'s homopolymerization of vinylpyrrolidone. Most pertinently, since the British reference employs polyalkylene glycols as the grafting base, the reaction mixture which is present under the conditions addressed in this reference already contains an abundance of the polyalkylene glycol "chain transfer agent" and therefore provides a pool of "more labile hydrogen atom" which can be added to growing polymer chain(s). There is, accordingly, no necessity whatsoever to introduce any additional polyethylene glycol to induce the radical forming chain transfer mechanism underlying the graft copolymerization of GB 922,457." See page 7 of the brief.

In response, it is pointed that Wu et al. also teaches a process in which PEO-300 is present in the polymerization mixture comprising monomer. See column 3, EXAMPLE 2. Thus, the free radical polymerization conditions of GB 922,457 are comparable with the conditions of Wu et al. Further, with respect to applicants arguments that there is "no necessity whatsoever to introduce any additional polyethylene glycol to induce the radical forming chain transfer mechanism underlying the graft copolymerization of GB 922,457", it is pointed out that 1) appellant is arguing against a single reference when the rejection was based on combination of references, 2) GB 922,457 also discloses

that the polymerization can be carried out in a continuous manner, and 3) GB 922,457", teaches that both the solid and liquid polyalkylene glycol function as a chain transfer agent because both produce graft copolymers and also teaches that to improve probability of transfer, it is preferred to polymerize in homogeneous phase in the absence of additional solvents. Thus, from the teachings of Wu et al. which teaches that better molecular weight control, viscosity control are obtained in free radical polymerization by adding free radical initiator in liquid PEO 300 to polymerization mixture comprising PEO-300, and monomer, one of ordinary skill in the art would have been motivated to add free radical initiator in liquid polyethylene glycol to the polymerization mixture with the expectation of having better control of viscosity i.e in maintaining homogeneous phase, and better control on the polymer molecular weight i.e polymer architecture.

For the above stated reasons, said claims are properly rejected under 35 U.S.C. 103(a). Therefore, said rejection is adhered to.

(11) Related Proceedings Appendix

None



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May 24, 2007

Respectfully submitted,

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